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repeatedly upon agar-agar made from this substance with meat extract and peptone, to which 2 per cent. of grape sugar (glucose) and .03 per cent. tartaric acid were added to approximate the proportion of these substances in ripe grapes. These perithecia contained mature asci and ascospores, and are apparently referable to the same species found heretofore in the old, rotted grape berries and referred to diverse genera—*Physalospora*, *Larstadia* and *Guignardia*. It seems referable to the species known as *Larstadia Bidwillii* Viala & Ravaz.

CHARLES J. CHAMBERLAIN,
Secretary.

THE NEW YORK ZOOLOGICAL PARK AND AQUARIUM.*

THE year 1902 has been a notable one in the history of the New York Zoological Society. The municipality of New York through Park Commissioner Willcox invited the society to take over the direction of the New York Aquarium. This was a mark of strong approval by the city of the management of the Zoological Park by the society. After some deliberation the invitation was accepted, the necessary legislation at Albany was secured, and a contract was made with the municipality whereby the society should receive not less than \$45,000 per annum for the maintenance of the aquarium, and should assume entire control of the personnel and the right to dismiss any of the existing employees, the contract to be terminable on six months' notice on the part either of the society or of the municipality. Mr. Charles H. Townsend, of the United States Fish Commission, was invited to become director of the aquarium. For conference and advice the society appointed a scientific committee including Professor Charles L. Bristol, of New York University, Professor Bashford

Dean, of Columbia, Dr. Alfred G. Mayer, of the Brooklyn Institute of Arts and Sciences, and two other gentlemen. Fortunately, at this time Mr. Townsend was sent abroad by the United States government as expert in connection with the Seal Fisheries dispute with Russia, and this enabled the society to arrange for a complete tour of the aquaria of Europe. Mr. Townsend brought back plans, photographs and notes upon the best features of the foreign aquaria.

The director, with the aid of the advisory committee, has already experimented on a number of important changes in the aquarium, including a new system of labeling and illumination of the tanks. He has also planned the introduction of a fish-hatching exhibit which will be in operation throughout the year, the arrangement for a larger variety of exhibits, especially of invertebrate forms of marine life, the closer touch with the public school system of New York by making provision for supply of material in connection with the biological courses in the schools, etc. Alterations in the aquarium, which will vastly improve the interior, are now being considered at an estimated cost of \$30,000. It is probable that the necessary appropriation will be made, and that by next year the aquarium will be thoroughly well appointed. Fortunately, the design is admirable in all respects except illumination and ventilation, and both these defects can be remedied.

The attendance averages 5,000 persons a day, and the opportunities for spreading a knowledge and love of nature among the people of the city are very great.

THE ZOOLOGICAL PARK.

In the Zoological Park the attendance this year was 731,515, an increase of 38 per cent. or 200,000 over the year 1902. There were 127,000 visitors in the month

* From the seventh annual report.

of August alone. As soon as the rapid-transit system is completed, it is anticipated that the number of visitors will double or treble.

The maintenance provided by the city for the year was \$85,000, but the cost of running the park exceeded this by \$3,500, paid by the society. For the year 1903, owing to the increased area occupied by the park and the addition of several new buildings and installations, the city has provided a maintenance of \$104,965. This is necessary for the care of a park one third as large as Central Park, and of collections now including 2,000 animals, of all kinds. The income from franchises and gate receipts during the year was \$7,000, all of which was devoted to additions to the collections. The membership is at present 1,210; and efforts are being made to increase this to 3,000. In July, 1902, the Board of Estimate and Apportionment appropriated an additional \$250,000 for the improvement and extension of the park. With these funds the system of paths has been increased by a broad walk east of the Bronx River, and another walk through the beautiful portion of the forest known as Beaver Valley, in addition to the erection of the buildings enumerated below. The society is now making application for \$250,000, to be made available July 1, 1903.

The mountain sheep hill has been completed in a most admirable manner under the direction of the head forester, carrying out the general designs of Director Hornaday. The bear dens have been extended to the south, and now complete this series of installations, affording space for every species of this family which can be secured. The collection of bears is already the most complete in existence.

The chief event is the construction of the lion house, at a cost of about \$150,000, from designs by Heins & La Farge, with sculp-

ture by Mr. Eli Harvey, including finely carved sentinel lions, and two pediments, besides a variety of heads in the cornice, of the principal types of the cat family. The feature of this building is the treatment of the interior of the cages with light-green opalite tile, and a frieze of faïence tile representing desert and jungle scenes for the lions and tigers, respectively. The director was sent abroad especially to select animals for this building, with funds amounting to \$13,000 donated by individual members of the board of managers. The building will be opened and completely stocked during the month of February.

The antelope house is also well under way, at a cost of \$54,900. This will enable the society to add the African types of quadrupeds to its exhibits in addition to those already shown in the lion house. The bird and ostrich house has been designed for the west side of a new south court, to be named Audubon Court, bounded on the north by the reptile house, on the south by the antelope house, and on the east by the mountain sheep hill.

In addition to the sum of \$25,000 subscribed chiefly for the increase of collections, the park has received some valuable gifts, including an antique Italian fountain, valued at \$25,000, presented by Mr. William Rockefeller; also a memorial gateway to Joseph Lydig, former owner of the forest tract of this park.

During the coming spring the entire southern portion of Baird Court will be put in order, including the lion and the monkey houses, the large sea-lion pool, and the Rockefeller fountain. Plans are also in preparation for extending the eastern portion of the park, and perfecting the southern terminus by a plaza connected with the new rapid-transit system.

One of the most important features of

the year is the establishment of a thoroughly organized medical department under the direction of a veterinarian and a well-known human pathologist. A pathological laboratory is in charge constantly of an assistant, and daily rounds are made by an officer of the medical staff in company with the curators of the respective departments. Full reports are being kept of the symptoms of animals of various types, and of the causes of death. From these records it is proposed to prepare a special work on the habits, care and treatment of animals in captivity. The larger ruminants, especially, are susceptible to gastro-enteritis, and a disappointing feature of the work is the liability to these diseases which has been engendered on the larger ranges. Until the soil and grasses of these ranges have been thoroughly re-treated, it appears that better results are secured by keeping the animals in enclosures than by allowing them free range. After a number of experiments, entirely successful methods of feeding for the prong-horned antelope and for the caribou have been discovered, and these animals are in fine condition. The western varieties of deer, the moose, the buffalo, and to a certain extent the wapiti, are still being studied.

A feature of the management of the park is the appointment of scientific curators instead of keepers in principal charge of the animals. At present the director acts also as head curator of mammals. Mr. R. L. Dittmars has recently been promoted to the full curatorship of reptiles, and assists Mr. Hornaday with the mammals. Mr. C. William Beebe has been promoted to the full curatorship of the birds. By this means a continuous series of observations of the habits of animals is being made and recorded. Mr. Beebe has been especially successful in the rearing of birds, and has made a number of valuable

discoveries in the medical treatment of birds.

The chief publication of the year is by the secretary, Mr. Madison Grant, on the barren-ground and woodland caribou of the northern hemisphere.

Another function of the society has been duly followed during the year, namely, game protection. The secretary has been actively instrumental in connection with the new game laws of Alaska, Newfoundland and British Columbia, and a special fund of \$3,000 has been presented to the society by Miss Stokes, of New York, the interest of which is to be devoted to the protection of birds.

The society has enjoyed the cordial co-operation of Commissioners of Parks of the Bronx and of Manhattan; also the support of Mayor Low and of Comptroller Grout. The relations with all the officers of the city have been of the most friendly character. New York now bids fair to become a model city in the management of its scientific institutions. With Professor Bumpus as Director of the American Museum of Natural History, Mr. Hornaday as Director of the New York Zoological Park, Mr. Townsend as Director of the New York Aquarium, and Dr. Mayer in charge of the zoological division of the Brooklyn Museum, the prospects for the future are extremely bright.

HENRY FAIRFIELD OSBORN,
Chairman of the Executive Committee of the N. Y. Zoological Society.

SCIENTIFIC BOOKS.

Economics of Forestry. A reference book for students of political economy and professional and lay students of forestry. By BERNHARD E. FERNOW, director of the New York State College of Forestry. New York, Thomas Y. Crowell & Co. 1902. Pp. ix + 520. \$1.50.